

**CALIFORNIA STATE UNIVERSITY-SAN BERNARDINO, CA  
COLLEGE OF THE DESERT, PALM DESERT, CA**

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**Abstract:** New relationships between NASA-Dryden and College of the Desert (COD), a 2-year College with 52% Hispanic enrollment will be established. Existing relationships between NASA-Dryden and California State University-San Bernardino (CSUSB), a 4-year Hispanic Serving Institution (HIS) will be strengthened and expanded upon. Additionally, a more seamless transition from COD to CSUSB for STEM students will be established. An innovative four-week intensive enrichment experience will inspire, motivate, excite and increase the confidence of at least 24 two-year college students. One new course will be created and six courses will be revised to expand “materials science” content in the curriculum. Materials are critical to most NASA programs and missions. We propose curriculum changes to the pre-engineering courses (such as introduction to electronics), engineering physics sequences such as the ones offered at both CSUSB and COD, and modification of the materials course at CSUSB (Physics 318) and the corresponding materials course at COD. In addition, implementation of new peer instruction models and a broad study of physics teaching methods will be undertaken in the introductory physics courses for K-12 teachers.

**Intrinsic Merit:** The Project design includes development of a pipeline of STEM students in a discipline that is a core competency for NASA. All investigators are qualified to successfully carry out the activities presented in this proposal. The investigators have done an excellent job of providing the quality and feasibility of the proposed project, targeting the appropriate institution(s), and have very strong and appropriate partnerships. The proposal will assist many students, including underrepresented and underserved students, directly and indirectly. The students will have contact with faculty, hands-on activities, and an opportunity to work at NASA Dryden. The students participating in the activities proposed will be a part of "cutting edge" courses, work and projects with hands-on experience and various research opportunities. It is evident that the activities will be very exciting, stimulating, and enjoyable to the students.

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## FOND DU LAC TRIBAL COMMUNITY COLLEGE-CLOQUET, MN

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**Abstract:** The Fond du Lac Tribal and Community College (FDLTCC) project emphasizes curriculum development and enhancement in the area of environmental modeling, specifically in courses within Computer Science, Earth Systems Science, and Remote Sensing. In Computer Science, a new course, Client-server Applications Using HTTP and TCP/IP Sockets. In Earth Systems Science, emphasis is placed on providing students with a firm foundation in physical science concepts so that they can build upon these knowledge and skills as they progress through more rigorous and academically challenging STEM courses. Existing courses in computer science, biology, environmental science, remote sensing, GIS and geography will be enhanced by developing modules based on research activities of participating faculty. Targeted courses are introductory level and are part of General Education requirements rather than those taken by STEM majors.

**Intellectual Merit:** This extremely professional well written proposal is very relevant to NASA's stated educational objectives. The proposal has substantive technical goals, which are achievable within the stated budget. Their goals are clearly coupled to the NASA Earth and Space Sciences mission. It has a systemic plan for addressing the problems of retention and graduation of underrepresented STEM students. The environmental aspect of this project takes into consideration the Native American culture among many of the students and builds upon the value system of the culture in developing a deepened understanding and appreciation of the environment. The PI and one co-PI have previous involvement in NASA projects through the NASA-AIHEC Summer Research Experience, and collaborated directly with NASA researchers. The faculty, which are performing the technical tasks, are clearly in charge of the day to day operation of the program. The faculty also plan to introduce concepts in robotics and computer science at a level that is both useful and engaging for the students. Appropriate partnerships are in place as a result of previous collaborative research work. They have developed a variety of assessment tools and an external advisory group of academic professionals to monitor the progress of the program. They have built around existing partnerships and leveraged them to good effect. They have addressed the issue of a sustainable program and the dissemination of results to the technical community.

**NAVAJO TECH (CROWNPOINT INSTITUTE OF TECHNOLOGY),  
CROWNPOINT, NM**

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**Abstract:** This proposal addresses the need to increase the number of Native Americans who pursue and excel in advanced courses and careers in STEM subjects. Navajo Technical College (NTC), in partnership with the Louisiana State University National Center for Advanced Manufacturing (NCAM), intends to strengthen existing STEM (science, technology, engineering, and mathematics) curriculum and increase the number of underrepresented and underserved Native Americans pursuing STEM degrees at the undergraduate level, increase the completion rates of students enrolled in STEM programs, and strengthen teacher preparation in these areas so that they will be better equipped to meet the needs of students enrolled in these programs. These curriculum improvements will also assist the college in its quest for its Masters Accreditation in Engineering. NCAM is a partnership of government, academia and industry fulfilling the technology needs of aerospace and commercial markets in the area of composites manufacturing and technologies. This proposal focuses on strengthening and institutionalizing permanent connections between tribal colleges and leading researchers, thereby allowing NASA to meet the emerging educational needs of its industries. Curriculum reform is being undertaken using a project-based learning approach. The overarching goal is to ensure that tribal students graduate with a skill set that will best position them to obtain gainful employment in 21st century industry needs.

**Intellectual Merit:** This is an exceptionally well-written proposal that clearly articulates the goals and objectives of the PI as well as clearly explaining the rational for the approach being proposed, the implementation plan, and the evaluation plan. Care was taken to articulate the success of prior NASA funded efforts and the manner in which a strategic foundation had been laid for the development of the current proposal. The PI clearly understands the importance of a) faculty development, b) stimulation of student interest, c) curriculum relevance and content, d) entrepreneurial opportunity, e) establishment of learning communities, e) student involvement in educational program design, f) continuous strategic evaluation, and g) competent management. The project is clearly feasible and has a high probability for successful implementation. Recognition of the critical role of highly qualified faculty is also evident in the faculty development components of the proposal. The combination of peer mentoring, faculty mentoring, hands-on learning, internships and student community building demonstrates a commendable awareness of what it takes to develop an effective and sustainable educational program that is culturally sensitive to the needs of the Navajo Nation. The value added of the proposed partners is clear and the roles and responsibilities of partners are clear. The description of evaluation methodology was very well written.

**RUST COLLEGE-HOLLY SPRINGS, MS**  
**MID-SOUTH COMMUNITY COLLEGE (MSCC), WEST MEMPHIS, AR**

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**Abstract:** Rust College in collaboration with Mid-South community College will develop and engage in activities that will promote STEM research, enhance faculty expertise and increase the number of faculty and students participating in NASA related research. Two research thrust areas are focused upon in this project, Exobiology and Water Quality/Reclamation respectively. The Exobiology research will be done at NASA Ames while the Water Quality/Reclamation research will be done at NASA Marshall Space Flight Center (MSFC). Other students will participate in a CIPAIR Summer Academy program at Rust College. The program includes hands-on research in Atmospheric Science and a trip to a planetarium. At the end of a successfully implemented CIPAIR project, it is anticipated that Rust College and Mid-South Community College will:

1. Develop significant strength and expertise in the chemistry and biology fields to compete nationally for further research grants.
2. Develop new courses and/or update existing course with NASA related STEM materials. This should result in better prepared student.
3. Expand the pipeline of students transitioning from MSCC to Rust College.
4. Establish a culture of students excited and pro-active in hand-on research activities.

**Intellectual Merit:** The content of Rust College's proposal is strong and feasible and exhibits merit in its goals and objectives. The proposed project demonstrates a high probability for successful implementation. The plan facilitates relevant interactions between faculty and Department Heads at the two institutions, as well as direct engagement with NASA scientists for both Rust and MSFC faculty. The customer focus ' students -- is attentive to the needs presented in the plan to scaffold high school and college students into research. The inclusion of students in the review process allows for student needs to be articulated in ways that can constructively inform the faculty. This is to be done after students and faculty engage in research at the NASA Center, or in summer research at Rust, in consultation with NASA scientists. This is a pragmatic approach to ensuring successful articulation and smooth advancement for the students from MSCC to Rust. Department Heads and key faculty from both institutions will consider the continuity of course requirements together, and also involve students in the process. The management plan is sound, properly involving qualified key personnel from NASA, MSCC and Rust. Rust and MSCC are to be commended for their management structure. The budget is appropriate, realistic and demonstrates effective use of federal funds. The two institutions have proposed to share resources quite equitably. This reflects a commitment to sustaining a genuine partnership.